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Appraisal

Critically Appraised Papers

Outpatient-based physical rehabilitation does not affect exercise capacity in survivors of prolonged critical illness

Synopsis

Summary of: McWilliams DJ, Benington S, Atkinson D. Outpatient-based physical rehabilitation for survivors of prolonged critical illness: A randomized controlled trial. *Physiother Theory Pract.* 2016;32:179-190.

Question: In survivors of prolonged critical illness, does a program of outpatient-based physical rehabilitation improve exercise capacity compared with no outpatient intervention? ***Design:*** Randomised, controlled trial with blinding of outcome assessors. ***Setting:*** Single tertiary centre in the United Kingdom. ***Participants:*** Inclusion criteria were being aged > 18 years and requiring invasive mechanical ventilation for > 5 days. Exclusion criteria were: physical condition precluding participation in rehabilitation or cardiopulmonary exercise testing; psychiatric condition or impairment precluding informed consent or rehabilitation compliance; participation in alternative rehabilitation; poorly controlled cardiorespiratory disease or terminal illness. Randomisation of 73 participants allocated 37 to an intervention group and 36 to a control group. ***Interventions:*** Participants randomised to the intervention group received a 7-week outpatient-based exercise (circuit interval training sessions) and education program. Prescription of exercise intensity was titrated to the initial 6-minute walk distance. The rehabilitation program comprised three 20-minute sessions per week (one supervised and two self-directed) with six 1-hour education sessions (including relaxation, smoking cessation and management of dyspnoea and anxiety). Participants randomised to the control group received no intervention during the study period. ***Outcome measures:*** The primary outcome was the change in exercise capacity, expressed as the peak rate of oxygen uptake and the anaerobic threshold, which were measured during a cardiopulmonary exercise test. The secondary outcome was change in health-related quality of life, which was assessed using the Short Form-36 Health Survey Version 2. ***Results:*** A total of 63 participants completed the study. At the end of the study period, there were no significant between-group differences in the change in peak rate of oxygen uptake (MD 0.2 ml O_2 kg^{-1} min^{-1}, 95% CI −1.3 to 1.7) or anaerobic threshold (MD 0.0 ml O_2 kg^{-1} min^{-1}, 95% CI −1.3 to 1.3). The changes in the health-related quality of life physical component summary score and mental component summary score were greater in the intervention group compared with the control group (MD 5.1 points, 95% CI 1.5 to 8.7 and MD 5.9 points, 95% CI 0.8 to 11.0, respectively). ***Conclusion:*** Compared with no intervention, a 7-week outpatient physical rehabilitation program did not change exercise capacity, although improvements were observed in health-related quality of life. [95% CIs calculated by the CAP Editor]

Provenance: Invited. Not peer reviewed.

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Commentary

McWilliams and colleagues should be commended on their efforts in conducting a randomised, controlled trial of rehabilitation for patients surviving critical illness in the period after hospital discharge. More than 900 patients were screened over a 4-year period in order to randomise 73 participants into the trial; however, this was still insufficient to achieve 80% power. While this makes drawing conclusions about the effectiveness of this intervention difficult, it does highlight the challenges of recruitment and follow-up in this patient population, where returning to hospital can be both logistically and emotionally difficult.[1]

This study conducted maximal cardiopulmonary exercise tests on survivors of prolonged critical illness with no adverse events. However, specific results of the cardiopulmonary exercise tests, such as the primary cause of exercise limitation (eg, cardiac, pulmonary or peripheral), were not reported and did not appear to influence the exercise prescription component of the intervention. It is possible that the exercise prescription was neither appropriately targeted nor continued for an effective duration; therefore, the intervention may not have translated into a measurable outcome. The authors have accurately acknowledged the limitations of the study, including the omission of an endurance measure of exercise capacity, especially as this patient population has evidence of substantial muscle weakness and fatigue.[2]

The improvement in health-related quality of life, as indicated by the mental *and* physical component scores of the Short Form-36 Health Survey Version 2, is an important finding, despite the lack of statistically significant between-group differences in exercise capacity. Group-based exercise and educational aspects of rehabilitation programs warrant further investigation in this population, given the documented psychological impact of critical illness.[3]

This study has highlighted the need to better understand the physical and mental components of recovery, in order to design individualised rehabilitation programs with the aim of improving survivorship for patients following critical illness.

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